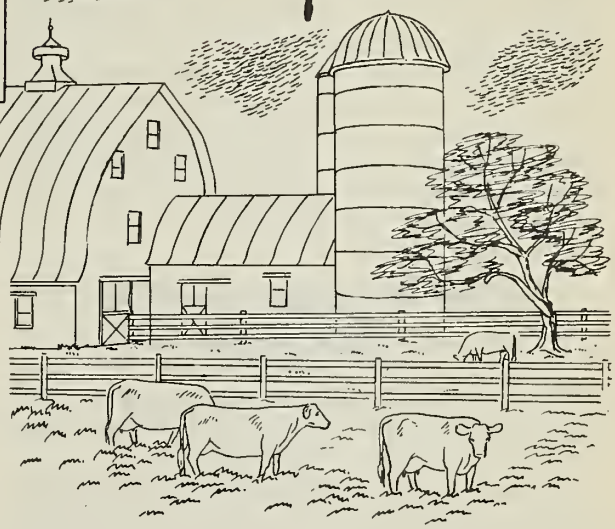
HOW TO GET MORE MILK from your Pastures

U. S. DEPARTMENT OF AGRICULTURE
Agricultural Research Administration
Bureau of Dairy Industry
Information Supporting
THE LONG-RANGE DAIRY PROGRAM



GOOD PASTURES and GOOD PASTURE MANAGEMENT are essential for the successful operation of a long-range dairy program. No dairyman can afford to neglect his pastures. Pasture crops not only furnish essential and nutritious feed for the dairy herd, but they play an important role in conserving and improving the fertility of the soil.

About 38 percent of all the feed consumed by dairy cattle now comes from pasture crops, but pastures could make a still greater contribution to the total feed supply if they were made more productive and were used more efficiently.

Productive pastures as a rule are a cheaper source of the nutrients needed for milk production than any other crop, largely because the cost of establishing the pasture is spread over a period of years and the grazing animals reduce the labor and cost of harvesting.

Studies conducted over a 4-year period by the Bureau of Dairy Industry at its Huntley, Mont., field station showed that, when all costs were included, pastures produced feed nutrients at a much lower cost than alfalfa hay, grass silage, corn silage, or grain crops like oats and barley. Grown on good irrigated land, the crops produced 100 pounds of total digestible nutrients at the following cost:

Crop, and yield per acre:	*Cost per 100 pounds of TDN*
Pasture (250 days' grazing)	$0.29
Alfalfa hay (4.7 tons)	.49
Corn silage (13.7 tons)	.91
Grass silage (13.0 tons)	1.17
Oats, grain (66.0 bushels)	1.19
Oats, grain (63.0 bushels)	1.29
Corn silage (9.6 tons)	1.31
Barley, grain (40.0 bushels)	1.40

The economic advantage of pastures over other crops is in itself an excellent reason for doing everything possible to improve their productivity and to manage them so as to get the greatest benefits from them.

MORE MILK PER ACRE FROM GOOD PASTURES

In an experiment by the Bureau of Dairy Industry at the Agricultural Research Center, Beltsville, Md., well-fertilized, rotationally grazed bluegrass pasture produced on the average 3,958 pounds of 4-percent milk per acre.

At the Bureau's Lewisburg, Tenn., field station, bluegrass pasture that had been limed and manured and otherwise well-managed produced on the average 3,677 pounds of 4-percent milk per acre, as compared with 1,994 pounds on the untreated check pasture.

The Maine Experiment Station reports yields of 5,000 pounds of 4-percent milk per acre from Ladino clover pasture on good land. The Oregon Experiment Station reports 5,760 pounds of 4-percent milk per acre on irrigated Ladino clover pasture.

Studies in New Jersey showed that dairymen who had a good pasture-and-roughage program obtained 72 percent of their feed requirements from pasture and roughage and produced 100 pounds of milk at 40 cents less than other dairymen who obtained only 52 percent of their feed nutrients from pasture and roughage crops.

These experiments show that good pastures can be depended on to produce lots of milk at a reduction in feed cost. Many experiments indicate that dairymen are warranted in using *good land* to provide pasturage

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for *good dairy cows*. Pasture is no longer a term to apply only to land that is too steep, too rocky, or too poor to grow other crops.

Dairymen in any area in the United States, where there is good soil and a fair amount of moisture, can find adapted legumes or grasses that will make good grazing. The local county agent, or State college specialists, should be consulted about recommended pasture varieties and programs.

Only a relatively few pastures produce as much as they would if they were given the best possible attention. Following are some suggestions on how pasture yields can be increased and on how pastures can be used to better advantage, especially during the time of year when milk is most needed.

PLAN A SOUND PASTURE PROGRAM

The objective of a planned pasture program should be to provide adequate and nutritious grazing throughout as much of the year as possible.

Permanent pastures will usually be the basis of the pasture program. Properly established with adapted legumes and grasses on good soil, and properly fertilized and efficiently managed, they will provide earlier grazing in the spring and later grazing in the fall, as well as more abundant grazing throughout the season.

Plans should also be made to provide additional grazing at times of the year when the permanent pastures are inadequate, by seeding crops for temporary or supplemental pastures.

Good pasture planning and management will—

1. **Insure abundant succulent forage for the herd throughout the entire season.**
2. **Provide natural, palatable, and nutritious feed for the milking herd at all times.**
3. **Save labor and harvesting costs in feed production and reduce the need for high-priced purchased feeds.**
4. **Produce greater annual profits.**

Earlier grazing on permanent pasture

Set aside a part of the permanent pasture and top-dress it with nitrogen fertilizer in early spring to provide earlier grazing.

If barnyard manure, phosphorus, and potash are applied to the entire pasture in the fall and nitrogen is applied to a part of the pasture in the spring, the nitrogen-fertilized portion will provide grazing some 2 weeks earlier than the rest of the pasture.

By the time the earlier growth is grazed off, the rest of the pasture should have from 4 to 6 inches of growth ready for grazing.

Additional summer grazing

Temporary pasture crops, such as Sudan grass, sweetclover, pearl millet, soybeans, etc., can be seeded in spring or early summer to provide grazing after the permanent pastures begin to fail. Wet areas should be seeded to adapted crops, such as Reed canary grass and tall fescue.

Sudan grass should not be grazed until it is 12 to 15 inches high, and not after it has been frosted in the fall, in order to avoid prussic acid poisoning.

Late summer and fall grazing

Some of the permanent pasture should be reserved for late fall grazing.

Meadow aftermath can be grazed. Early-cut meadows, if fertilized when the hay is removed, will make a good second cutting of hay or furnish good grazing in late summer and fall.

Small-grain crops may be seeded in the fall for both late fall and early spring grazing. In certain areas, and on the right soils, such crops will furnish 2 to 3 weeks of the latest grazing in the fall and will provide the earliest grazing in the spring. In many areas these crops can be grazed at intervals throughout the winter.

Light, sandy soils with good drainage are best adapted for fall-pasture crops. On such soils in the South, seedings of ryegrass and crimson clover, or seedings of small-grain crops (oats, rye, wheat, or barley) with crimson clover, vetch, or lespedeza will furnish abundant winter grazing. The use of these crops is more limited in the North, but under good conditions they will furnish grazing in the late fall months and also about 2 weeks earlier than permanent pastures in the spring.

Fall-seeded crops that are to be harvested for grain should not be grazed too heavily in the fall nor after the plants start to joint in the spring.

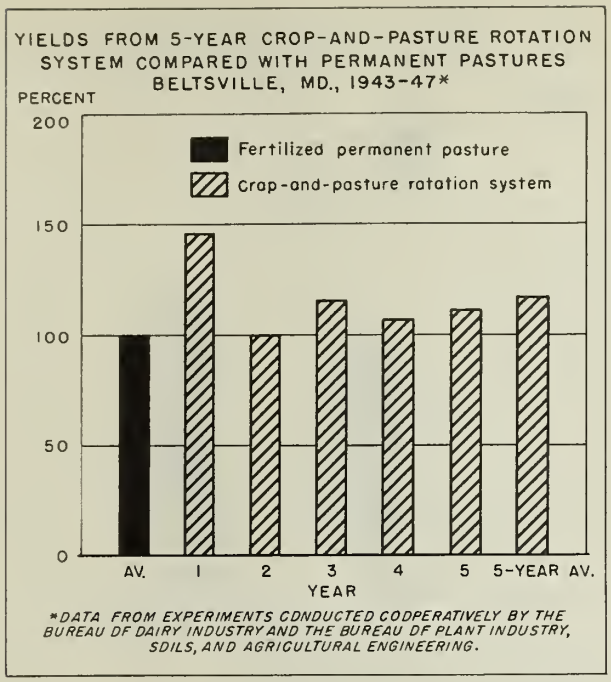
Include pasture in the crop-rotation system

Plan to make pasture and hay crops a part of the regular crop-rotation system on the farm. Experiments now under way at Beltsville indicate that such a pasture-and-crop rotation is both feasible and profitable.

The 5-year rotation includes corn for silage the first year, wheat for grain the second year, and grasses and legumes for pasture or hay the next 3 years.

To start the rotation experiment, a permanent pasture of Kentucky bluegrass and white clover was divided into a number of fields, one of which was left for comparison with the rotation crops and fertilized in the same way.

The pasture sod was manured (10 tons per acre) and plowed in the fall for corn the next year. The corn



was ensiled and 400 pounds of 0–14–14 fertilizer was applied per acre on the stubble, which was then disked and seeded to wheat (1 bushel) and orchard grass (6 pounds) or bromegrass (10 pounds). In the following spring 3 pounds of red clover and 2 pounds of Ladino clover were broadcast in the wheat. The wheat was threshed for grain, and the stubble and new seeding was grazed lightly in the fall. The next 3 years, the field was in grass and clover which was used for pasture or hay. An additional 400 pounds of 0–14–14 fertilizer was applied in the fall of the second year of the grass-and-legume pasture.

The average yield of nutrients in the corn, wheat, and grass-legume pasture and hay crops over the 5-year period was 16 percent more than the yield from the permanent pasture, which received the same fertilizer treatment. Moreover, when summer rainfall was below normal, the rotation system provided more grazing in the late summer and fall months than the permanent pasture—a time when more grazing is usually needed.

Renovate old permanent pastures

Old permanent pastures, which commonly consist of bluegrass and white clover or orchard grass and white clover, are usually unproductive, especially in late summer. In experiments at Beltsville, renovation of old permanent pastures has proved beneficial.

In the fall, a part of the permanent pasture was heavily manured, limed, and then torn up with a heavily weighted disk harrow. The cut-up sod was left on the surface as a protection against erosion. Early in the spring 500 pounds of commercial fertilizer (0–14–7) was broadcast, and the pasture was double disked and harrowed again before being reseeded with a good pasture mixture containing bromegrass, alfalfa, red clover, and Ladino clover.

The rather weedy first growth was cut for silage in late May. From early July through the fall months, the pasture was grazed several times in rotation. In the late summer and fall months, the renovated pasture produced more feed than the part of the permanent pasture that had received the same fertilizer treatment but no renovation.

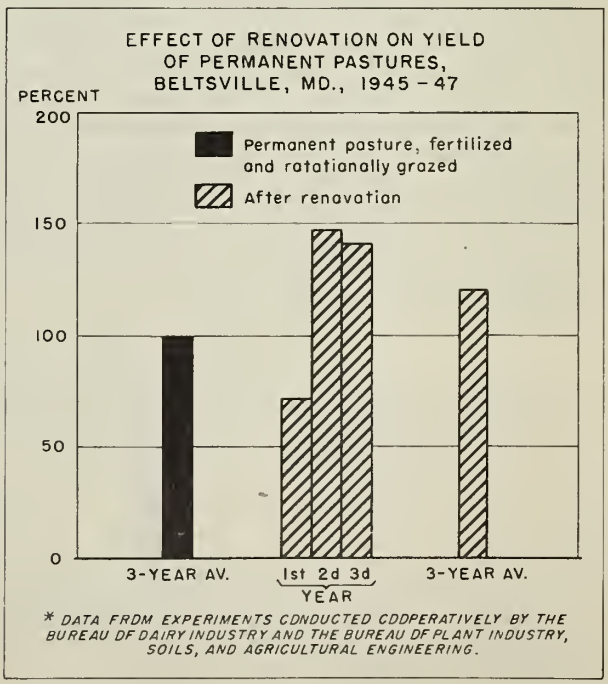
Since the renovated pasture was out of production during the spring months of the first year, it produced only 69 percent as much feed as the nonrenovated pasture the first year; but during the next 2 years, the average yield on the renovated pasture was 50 percent higher than on the nonrenovated pasture. Renovation also produced earlier grazing in the spring, as well as more grazing throughout the season.

The renovation treatment can often be used successfully to restore and maintain pastures on land that is too rough or hilly to plow for cultivated crops.

Practice rotational grazing

Divide the pasture into several fields and graze the fields in rotation. This procedure will increase the carrying capacity of the pasture. While one field is being grazed, the others will have a chance to recover and make greater growth.

In experiments over a 6-year period at Beltsville, rotational grazing increased the yield of permanent pasture by 10 percent. In the same experiments, fertilization increased the yield by 16 percent. When



both fertilization and rotational grazing were practiced, the yield was 28 percent more than on unfertilized permanent pastures that were grazed continuously.

Rotational grazing also makes it possible to follow certain other good pasture management practices more easily—such as fertilizing, manuring, clipping, and irrigating.

GENERAL MANAGEMENT OF PASTURES

Do not overgraze a pasture. Overgrazing kills the desirable plants and allows weeds to gain a foothold.

Let the grasses and legumes get a good start (4 to 6 inches of growth) before turning the cows on the pasture.

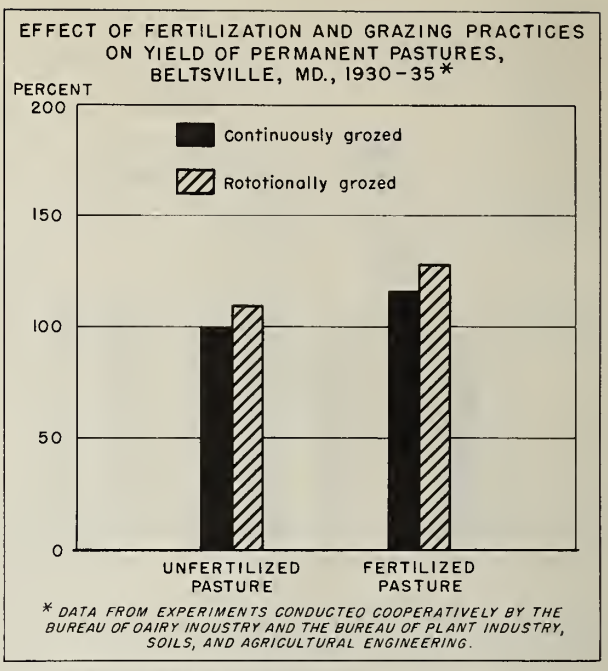
Scatter animal droppings as often as necessary to avoid grass clumps in the pasture.

Clip the pasture with a mower as often as necessary to remove ungrazed clumps and weedy growth. Clipping promotes new growth and more even grazing. Cows usually will eat the clippings after they wilt, or the clippings may be made into silage or hay if abundant. Trials by the Bureau of Dairy Industry at its Lewisburg, Tenn., field station showed that frequent clipping increased the net returns from permanent pastures by $15 an acre.

Rotational grazing not only increases the carrying capacity of a pasture but is essential for the maintenance of stands of clovers and other legumes in the pasture mixture. These plants must have a period of unmolested growth in which to replenish food reserves in their roots. Continuous overgrazing kills them.

Irrigation of pastures, even in the humid areas, holds possibilities for providing adequate grazing in late summer and fall. More fertilizer may be needed with irrigation, however, to produce extra growth.

On rotationally grazed pastures in the Northwest, the application of liquid manure immediately after a pasture is grazed has given a decided boost to subsequent growth. Rains wash the manure off the foliage and into the soil before the pasture is grazed again. In some instances, the liquid manure is applied by pumping it into the irrigation water.



Herd-management suggestions

Give the cows a feeding of dry hay before they are turned on any pasture that is rich in legumes, as a precaution against bloat.

A supplemental feeding of hay or silage when pastures begin to fail, from any cause, is good practice. Hay racks in the pasture that are kept well filled are good insurance against the summer slump in milk production.

Other essentials for efficient production on pasture are an abundance of clean fresh water in every pasture, also salt or salt-and-calcium mixture, and plenty of shade.

Feeding concentrates to cows on pasture

When cows are on *good* pasture they will need less grain and other concentrates to maintain high milk production than when they are on poor pasture. The following table shows how much milk may be expected from *good* cows on *good* pasture or on *average* pasture, and the amount of concentrates that should be fed to cows producing milk in excess of the amount expected from pasture alone:

TABLE 1.—*A schedule for feeding concentrates to cows on pasture*

Fat content of the milk (*Percent*)	Daily milk production that may be expected from good cows on—		Concentrates to feed for each additional 5 pounds of milk daily [3]
	Good pasture [1]	Average pasture [2]	
	Pounds	*Pounds*	*Pounds*
3.0	40	20	2.0
4.0	30	15	2.2
5.0	25	12	2.5
6.0	20	10	2.8

[1] Good pasture is young and succulent and abundant enough so that cows can graze their fill in 1 to 1½ hours several times daily.

[2] Average pasture is short and young or of somewhat advanced growth and is not palatable or abundant enough to permit cows to graze their fill in 2 to 3 hours several times daily. Poor pasture will no more than maintain the weight of cows. Some grain or hay may be necessary just to maintain weight if the pasture is very poor.

[3] If hay or silage is fed, reduce the grain by 0.6 pound for each pound of hay and 0.2 pound for each pound of corn silage consumed.

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